

Serial No. 10/892,212

## REMARKS

### Status of the Claims

Claims 1-4, 6-20, 24, 26-44 are pending herein, claim 5, 21-23 and 25 having been deleted and claims 30-44 having been added. Claims 1, 6, 9, 18, 20, 24 and 26-28 have been amended.

Support for the subject matter in the amended and new claims can be found, for example, in the originally pending claims. No new matter is added.

### Claim Rejection under 35 USC § 102(a)—Claims 1-3, 5-16 and 18-24

Claims 1-3, 5-16 and 18-24 are rejected under 35 USC §102(a) as being anticipated by U.S. Patent Publication No. 2001/0003271 A1 (Otsuki). Applicants respectfully traverse this rejection and its supporting remarks.

Otsuki describes the following (see Abstract):

A processing apparatus ... [that] has a mounted chamber holding a semiconductor wafer and having members for work-processing the substrate under any of heating, plasma and process gas or a combination of them, in which a film of Al<sub>2</sub>O<sub>3</sub> and Y<sub>2</sub>O<sub>3</sub> is formed on an inner wall surface of the chamber and on those exposed surface of the members within the chamber and has a high-corrosion resistance and insulating property and, when the process gas is introduced onto a processing surface of a semiconductor wafer and diffused into it, any product is less liable to be deposited on a plasma generation area and on those members held within the chamber.

Otsuki further teaches that the film is a thermal sprayed film (see paragraph [0042]). With respect to the base material, Otsuki teaches that “[t]he ceramics of the base material 13 may be Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, such as silica glass and quartz, AlN, alternatively, rigid plastic,” (see paragraph [45]), and that “[u]se can be made of, as the basic material, various kinds of materials such as ceramic herein used, aluminum, stainless steel, rigid plastic (engineering plastic) etc.,” (see paragraph [60]).

In contrast, the present invention contains three independent claims, claims 1, 20 and 30, which are reproduced below:

1. An erosion-resistant article comprising:  
a support selected from a silicon carbide support, an aluminum-silicon carbide support and a zirconium alloy support; and

Serial No. 10/892,212

an oxide coating comprising yttrium disposed over said support, wherein said support and said oxide coating have material compositions that differ from one another in coefficient of thermal expansion by no more than  $5 \times 10^{-6}/K$ , wherein said erosion-resistant article is a plasma process chamber component.

20. A method of making an erosion-resistant article comprising:

providing a support; and

providing an oxide coating comprising yttrium over said support by a process in which a powdered composition is sintered, wherein said support and said oxide coating have material compositions that differ from one another in coefficient of thermal expansion by no more than  $5 \times 10^{-6}/K$ , and wherein said erosion-resistant article is a plasma process chamber component.

30. An erosion-resistant article comprising:

a support; and

a sintered-powder oxide coating comprising yttrium disposed over said support, wherein said support and said oxide coating comprising yttrium have material compositions that differ from one another in coefficient of thermal expansion by no more than  $5 \times 10^{-6}/K$ .

With respect to claim 1, this claim differs from Otsuki at least in that it requires a support selected from a silicon carbide support, an aluminum-silicon carbide support and a zirconium alloy support in combination with (b) an oxide coating comprising yttrium disposed over the support. It is respectfully submitted that a support selected from a silicon carbide support, an aluminum-silicon carbide support and a zirconium alloy support is not taught nor suggested by Otsuki.

In particular, these materials have been selected in accordance with the present invention based on the fact that they have coefficients of thermal expansion that are closely matched to the oxide coating, specifically, differing by no more than  $5 \times 10^{-6}/K$ . As noted in paragraph [0015] of the present specification, such process chamber components are resistant to large thermal gradients. Consequently, spalling and cracking, which are observed with process chamber components such as, for example, YAG- or yttria-coated aluminum components (see, e.g., Otsuki), are substantially reduced.

For at least the above reasons, it is respectfully submitted that independent claim 1 is neither anticipated by nor obvious in view of Otsuki.

With respect to independent claims 20 and 30, these claims differ from Otsuki because they each require a sintered-powder oxide coating, which oxide coating comprises yttrium and is disposed over a support. Otsuki, on the other hand, teaches the use of a thermal spraying process

Serial No. 10/892,212

to form the oxide coating, and therefore would not have motivated one or ordinary skill in the art at the time of the invention to employ a technique whereby a powder is sintered to form the oxide coating.

Moreover, as with claim 1 above, claims 20 and 30 are further patentable over Otsuki, because Otsuki neither teaches nor suggests selecting coating and support materials that differ from one another in coefficient of thermal expansion by no more than  $5 \times 10^{-6}/\text{K}$ . For example, Otsuki teaches the application of a film of  $\text{Al}_2\text{O}_3$  and  $\text{Y}_2\text{O}_3$  onto aluminum (and other high expansion materials, for example, stainless steel), which does not meet this criterion (see, e.g., the table in paragraph [0065] of the present specification in which the thermal expansion coefficients of aluminum and YAG are contrasted), and which is known to promote spalling and cracking as noted above.

For at least the above, reasons, it is respectfully submitted that claims 1, 20 and 30 are neither anticipated by, nor obvious in view of Otsuki. Claims 2-4, 6-19, 24, 26-29 and 31-44, each of which depends directly or indirectly from claim 1, claim 20 or claim 30, are neither anticipated by or obvious in view of Otsuki for at least the same reasons as claims 1, 20 and 30.

Reconsideration and withdrawal of the rejection of claims 1-3, 5-16 and 18-24 under 35 USC §102(a) as being anticipated by Otsuki are therefore respectfully requested.

#### Claim Rejections under 35 USC § 103(a)—Claims 4 and 25-29

Claims 4 and 25-29 are rejected under 35 USC §103(a) as being unpatentable over Otsuki in view of U.S. Patent No. 6,310,755 (Kholodenko). Applicants respectfully traverse this rejection and its supporting remarks.

Moreover, it is noted that Kholodenko is cited under the provisions of 35 U.S.C. § 102(e). Please note, however, that the assignee of Kholodenko (Applied Materials, Inc.) and the assignee of the present application are one and the same. 35 U.S.C. § 103(c) reads as follows: "Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

Serial No. 10/892,212

**Statement concerning common ownership**

In compliance with M.P.E.P. 706.02(I)(2), it is submitted that Application No. 09/829,212 and U.S. Patent No. 6,310,755 B1 were, at the time the invention of Application No. 09/829,212 was made, owned by Applied Materials, Inc. or subject to an obligation of assignment to Applied Materials, Inc.

Accordingly, reconsideration and withdrawal of the rejection of claims 4 and 25-29 under 35 USC §103(a) as being unpatentable over Otsuki in view of Kholodenko are respectfully requested.

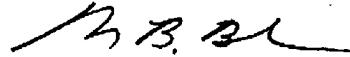
**CONCLUSION**

Applicants submit that the claims of the present invention are in condition for allowance, early notification of which is earnestly solicited.

**FEES**

The Office is authorized to charge any fees required to deposit account number 50-1047.

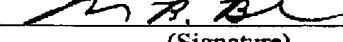
Respectfully submitted,



Attorney for Applicant  
Mayer Fortkort & Williams, PC  
251 North Avenue West, 2<sup>nd</sup> Floor  
Westfield, NJ 07090  
Tel.: 703-433-0510  
Fax: 703-433-2362

David B. Bonham  
Registration No. 34,297

**Certificate of Facsimile Transmission**  
I hereby certify that this document and any document referenced herein is being sent to the United States Patent and Trademark office via Facsimile to: 703-872-9310 on April 30, 2004.

\_\_\_\_\_  
David B. Bonham  
(Printed Name of Person Mailing Correspondence)  
\_\_\_\_\_  
  
(Signature)